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Resources, Community, and Economic Development Division B-279822

April 28, 1998

The Honorable Christopher Bond Chairman, Subcommittee on VA, HUD, and Independent Agencies Committee on Appropriations United States Senate

Subject: Results Act: EPA's Annual Performance Plan for Fiscal Year 1999

Dear Mr. Chairman:

As requested, this report summarizes our observations on the Environmental Protection Agency's (EPA) annual performance plan for fiscal year 1999, which was submitted to the Congress in February 1998. As you know, the Government Performance and Results Act of 1993 (the Results Act) requires federal agencies, beginning with fiscal year 1999, to prepare annual performance plans covering the program activities set out in their budgets. These plans are to (1) establish performance goals to define the level of performance to be achieved by an agency's program activities, (2) briefly describe the resources required to meet the performance goals, (3) provide a basis for comparing actual program results with the performance goals, and (4) describe the means to verify and validate the information used to report on performance. (See enc. I for a more detailed overview of the Results Act.)

We reviewed EPA's performance plan in terms of three basic questions: (1) To what extent does the plan provide a clear picture of intended performance across the agency? (2) How well does the plan discuss the strategies and the resources the agency will use to achieve its performance goals? (3) To what extent does the plan provide confidence that the agency's performance information will be credible? These questions are based on criteria in the Results Act, the Office of Management and Budget's (OMB) guidance to federal agencies on developing their plans, and a December 1997 letter to OMB from eight congressional leaders on their expectations for these plans.

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In summary, we found the following:

- Although certain performance goals could be better defined, EPA's plan generally sets measurable goals that can serve as a basis to evaluate the agency's performance for the fiscal year. Including more outcome goals in the plan, however, would better enable EPA to assess and report on how well it is achieving its strategic goals and mission.¹ In addition, the plan could more clearly link its performance goals to the measures that are to be used to assess whether they are achieved. Furthermore, the plan could more comprehensively describe how EPA's performance goals have been coordinated with those of other federal agencies, such as the departments of the Interior and Health and Human Services, that also have responsibilities for protecting human health and the environment.
- EPA's performance plan could more fully discuss the strategies and resources to be used to achieve its performance goals. EPA has combined the performance plan with its fiscal year 1999 budget justification to the Congress. As a result, the plan provides considerable information on how the agency intends to achieve its goals. However, the clarity and the completeness of the information is not consistent across all the plan's sections. For example, at times, additional information or better linkage of resources and strategies to performance goals is needed to clarify how the intended results will be achieved. The plan's discussions of strategies could also be improved if they explicitly recognized the potential impact of key external factors, such as the states' environmental programs. EPA has limited control or influence over such programs, even though they substantially affect its ability to achieve its performance goals.
- EPA's performance plan could provide greater confidence that the agency's performance information will be credible. The plan describes the procedures and methods the agency intends to use to verify and validate its performance information. These discussions generally identify the major sources of data that will be used to report on performance and the principal methods to verify and validate the data, such as peer review for research products and quality assurance procedures and quality control methods for computerized data systems. Across the plan, however, the

¹Outcome goals are those expressed in terms of program impacts or human health and environmental improvements, rather than the projects to be completed or the number of activities to be performed, which are referred to as outputs.

discussions of some of the verification methods could be more complete. For example, some discussions could provide more complete information by identifying data limitations; recognizing problems identified during reviews by EPA's Office of Inspector General, us, and others; and reporting the status of planned improvements. (See enc. II for a more detailed discussion of our observations.)

We provided a draft of our observations on the performance plan to EPA for review and comment. EPA provided written comments, which are reproduced in enclosure III. EPA stated that its fiscal year 1999 plan provides a strong foundation for improved annual planning and expressed its appreciation for our recognition of the strengths of the plan-measurable goals, good links between the strategic plan and budget, and the extent of information on how the agency intends to achieve its goals. EPA also said that it generally concurs with our observations on how future annual plans could be improved. In addition, EPA stated that it has addressed many of the management issues identified by audits and evaluations and is in the process of addressing others. The agency also said that it has taken steps to address the lack of coordination among EPA and other federal agencies, including working with a number of interagency groups to increase efforts to reconcile planned activities and develop consistent performance measures. EPA further stated that it is working to improve the information for reporting on its performance under the Results Act. For example, EPA said that it is developing a strategy for planning and conducting its monitoring of environmental conditions to better support its strategic and programmatic needs, including filling gaps in the data needed to report on the agency's progress in achieving its goals under the Results Act.

We performed our review of EPA's plan from February 1998 through April 1998 in accordance with generally accepted government auditing standards. We are providing copies of this report to the Members of Congress who requested our review of EPA's and other agencies' annual performance plans: the Speaker of the House; the House Majority Leader; and the Chairmen of the House Committees on Appropriations, the Budget, and Government Reform and Oversight. We are also sending copies to the House Minority Leader and Ranking Minority Members of these committees. In addition, copies are being sent to the Chairmen and Ranking Minority Members of the Senate Committee on Environment and Public Works and the House Committees on Commerce and on Science; the Director, Office of

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Management and Budget; and the Administrator, EPA. We will also make copies available to others on request.

If you or your staff have any questions about this report, please call me at (202) 512-6111. Major contributors to this report were Edward Kratzer, Raymond Smith, J. Kenneth McDowell, Richard Frankel, Donald Pless, and Derek Updegraff.

Sincerely yours,

Peter F. Guerrero

Director, Environmental

Protection Issues

Enclosures - 3

OVERVIEW OF THE GOVERNMENT PERFORMANCE AND RESULTS ACT

The Government Performance and Results Act of 1993 (the Results Act) is the primary legislative framework through which federal agencies are being required to set strategic goals, measure performance, and report on the degree to which their goals were met. For the first component, the act required each federal agency to develop, no later than the end of fiscal year 1997, strategic plans that cover a period of at least 5 years. These plans are to include the agency's mission statement; identify the agency's long-term strategic goals; and describe how the agency intends to achieve these goals through its activities and through its human, capital, information, and other resources.

For the second component, the Results Act requires each agency to submit to the Office of Management and Budget (OMB), beginning for fiscal year 1999, an annual performance plan. The first annual performance plans were submitted in the fall of 1997. The performance plan is to provide the direct linkage between the strategic goals outlined in the agency's strategic plan and the activities managers and employees conduct day-to-day. In essence, this plan is to contain the annual performance goals the agency will use to gauge its progress toward accomplishing its strategic goals and to identify the performance measures the agency will use to assess its progress. OMB will use individual agencies' performance plans to develop an overall federal government performance plan that it will submit annually to the Congress with the President's budget, beginning for fiscal year 1999.

For the third and final component, the Results Act requires that each agency submit to the President and to the Congress an annual report on program performance for the previous fiscal year. The first of these reports, on program performance for fiscal year 1999, is due by March 31, 2000, and subsequent reports are also due by March 31. For fiscal years 2000 and 2001, agencies' reports are to include performance data beginning with fiscal year 1999. For each subsequent fiscal year, agencies are to include performance data for the fiscal year covered by the report and 3 prior years.¹

In each report, an agency is to review and discuss its performance compared with the performance goals it had established in its annual performance plan. When a goal is

¹The Congress recognized that in some cases not all of the performance data will be available in time for the March 31 reporting date. In such cases, agencies are to provide whatever data are available, with a notation as to their incomplete status. Subsequent annual reports are to include the complete data as part of the trend information.

not met, the agency's report is to explain why; the plans and the schedules to meet the goal; and, if the goal was impractical or not feasible, the reasons for that and the actions recommended. Actions needed to accomplish a goal could include legislative, regulatory, or other actions. When the agency finds a goal to be impractical or infeasible, it should discuss whether that goal ought to be modified.

In addition to evaluating the progress made toward achieving the annual goals established in the performance plan for the fiscal year covered by the report, an agency's program performance report is to evaluate the agency's performance plan for the fiscal year in which the performance report was submitted. (For example, in their fiscal year 1999 performance reports, due by March 31, 2000, agencies are required to evaluate their performance plans for fiscal year 2000 on the basis of their reported performance in fiscal year 1999.) This evaluation will help to show how an agency's actual performance is influencing its plans. Finally, the report is to include the summary findings of program evaluations completed during the fiscal year covered by the report.

In crafting the Results Act, the Congress also recognized that managerial accountability for results is linked to managers' having sufficient flexibility, discretion, and authority to accomplish desired results. Beginning with fiscal year 1999, the Results Act authorizes agencies to apply for waivers of administrative procedural requirements and controls in order to provide federal managers with more flexibility to structure an agency's systems to better support program goals. The nonstatutory requirements that OMB can waive under the Results Act generally involve the allocation and use of resources, such as restrictions on shifting funds among items within a budget account. Agencies must report in their annual performance reports on the use and effectiveness of any Results Act waivers that they receive.

OBSERVATIONS ON THE ENVIRONMENTAL PROTECTION AGENCY'S ANNUAL PERFORMANCE PLAN

As requested, we reviewed the Environmental Protection Agency's (EPA) performance plan for fiscal year 1999, which was submitted to the Congress in February 1998. In conducting our review, we used the criteria in the Government Performance and Results Act (Results Act); the Office of Management and Budget's (OMB) guidance on developing the plans (Circular A-11, part 2); our February 1998 guidance for congressional review of the plans (GGD/AIMD 10.1.18); and the December 17, 1997, letter to OMB Director Raines from eight congressional leaders. For the purposes of our analysis, we collapsed the six requirements for annual performance plans in the Results Act and the related guidance into three core questions: (1) To what extent does the agency's performance plan provide a clear picture of intended performance across the agency? (2) How well does the performance plan discuss the strategies and resources the agency will use to achieve its performance goals? (3) To what extent does the agency's performance plan provide confidence that its performance information will be credible?

In summary, EPA's annual performance plan could be improved to (1) present a more complete picture of intended performance across the agency, (2) fully discuss the strategies and resources to be used to achieve the agency's performance goals, and (3) provide greater confidence that the agency's performance information will be credible. The strengths of the plan are that it (1) sets measurable goals that generally can serve as a basis for evaluating EPA's performance, (2) links performance goals to program activities in the agency's budget and to the agency's strategic goals and objectives, and (3) provides considerable information on how the agency intends to achieve its goals. Additionally, in several program areas, such as clean air, the plan either sets outcome goals or states the agency's intent to develop the performance measures and the baseline data needed to set them.

The performance plan could be improved in several ways. First, the quality and clarity of the plan could be more consistent across the individual sections of the plan—which is primarily organized by the agency's 45 strategic objectives. For example, not all sections have outcome goals, and various sections could be more complete or clearer for certain aspects, such as the linkage between key performance measures and performance goals. Second, the plan could more explicitly recognize and address management and other problems identified by our audits and evaluations and those of EPA's Office of Inspector General, and others, such as the National Academy of Public Administration and the President's National Performance Review. Third, the plan could more comprehensively discuss EPA's coordination of its performance goals and strategies with other federal agencies, such as the Department of Health and Human Services, that also have responsibilities for protecting human health and the environment.

We found that the quality of EPA's performance plan was often similar to the quality of its strategic plan, which was issued on September 30, 1997. For example, both plans provide considerable information on the strategies that the agency intends to use to achieve its goals. However, the plans contain limited discussions of coordination with other federal agencies and the ways in which external factors and management problems will be addressed. Although one of the strategic plan's noteworthy features was its description of crosscutting programs and EPA's plans for coordinating with the responsible agencies, it appears that EPA did not consistently build on that foundation in developing its annual performance plan.

EPA'S PERFORMANCE PLAN PROVIDES A PARTIAL PICTURE OF INTENDED PERFORMANCE ACROSS THE AGENCY

EPA's performance plan includes (1) measurable performance goals, including a limited number of outcome goals, to define the level of performance to be achieved by the agency's program activities and (2) indicators, or measures, to be used in assessing whether these goals are achieved. The plan also links the annual performance goals and strategies to the agency's mission, strategic goals and objectives, and the program activities in its budget request. However, to more clearly define its expected performance, EPA could clarify or add performance goals in certain program areas and better link its performance measures to its performance goals. To provide for a clearer connection among the agency's mission, performance goals, and program activities in the President's budget, EPA could link the amount of resources being requested and the strategies being planned to individual performance goals. Currently, the resources and strategies are linked to strategic objectives, under which several performance goals may be grouped. To better recognize efforts that cut across various agencies' programs, the plan could discuss in more detail EPA's efforts to coordinate its performance goals with other agencies that also have human health and environmental protection responsibilities.

Defining Expected Performance

The performance goals in EPA's plan are generally measurable and linked to the agency's strategic goals and objectives. In addition, the plan establishes quantifiable outcome goals for some programs. However, the quality of the agency's performance goals and measures are not consistent across the plan. Assessing the agency's fiscal year 1999 performance could be difficult in certain areas because the goals are not well defined, outside the time frame of the plan, or not comprehensive enough to cover all important program aspects. In addition, the connection between the performance goals and the measures to be used to assess EPA's success in achieving them is not always clear.

Generally, the performance goals are expressed as activities to be completed or results to be achieved by the end of fiscal year 1999. However, several of the plan's performance goals are for future years. OMB's guidance suggests that future-year goals may be appropriate if the funds being requested in one fiscal year will not be obligated or spent until a future fiscal year. However, for some parts of EPA's plan, the large number of goals for future years may make it difficult for the agency to report on its fiscal year 1999 performance in these areas. For example, six of the eight performance goals under one "Sound Science" objective are to be accomplished in future years—ranging from 2001 to 2008—and 6 of the 10 performance goals under one of the "Clean Air" objectives are to be accomplished in either 2000 or 2001. In addition, the wording of the performance goals is not always clear or sufficiently precise to allow the measurement of EPA's success. For example, one performance goal under the "Right to Know" strategic goal is "Continue to develop tools for data management programs integrating EPA data."

Outcome goals provide a better basis for EPA, the Congress, and the public to determine if the agency is achieving the intended impact or results with the resources that it is provided. For example, one outcome goal in EPA's performance plan is to reduce the emissions of toxic air pollutants by 12 percent in fiscal year 1999. This goal is measurable, addresses the desired results of EPA's efforts, and clearly links to the agency's strategic objective of reducing toxic air emissions by 75 percent (from 1993 levels) by 2010. However, the plan's other performance goals are predominantly outputs. Some major sections of the plan, such as the "Credible Deterrent" (enforcement) section, have no outcome goals. In several places, the plan discusses EPA's intent to develop the baseline data and performance measures to establish additional outcome goals but generally does not describe the status of these efforts.

In addition to these concerns, we identified two areas for which we believe adding performance goals to the plan would be beneficial: the Superfund program and information technology. Although the Superfund program has been criticized for taking a long time to clean up hazardous waste sites and using a large amount of funding for activities other than cleanup—such as legal fees—its performance goals are expressed as outputs, such as the number of site assessment decisions that will be made and the number of sites at which construction of the cleanup remedy will be completed. Although these performance goals may be needed, they do not directly address the timeliness and cost issues. Additional goals would be needed to allow the agency and others, such as the Congress, to explicitly monitor the success of the agency's efforts to reduce time frames and to control the amount of funds used for noncleanup activities.

EPA could also improve the performance plan by adding goals for implementing the information technology management requirements of the Clinger-Cohen Act of 1996 or by referring to a more detailed plan that does. The performance plan states EPA's intent to implement these requirements but generally does not set out specific performance goals

and measures. The plan could also be improved by establishing performance goals and measures for ensuring effective computer security for the agency's data systems. Computer security becomes even more important as EPA makes more data available to the public and receives more data from regulated entities through the Internet. For example, in September 1997, EPA's Office of Inspector General reported that the agency's Internet services were vulnerable to intruders' or hackers' adding, modifying, or deleting system files. According to the Office of Inspector General, six cases of hacker intrusions between 1992 and 1996 were documented, and it is probable that many more cases have occurred. The performance plan does not discuss computer security and how it is being addressed across the agency.

Although EPA's plan generally provides a set of performance measures for each set of performance goals, it is often difficult to clearly link individual measures to individual goals. For example, one "Right to Know" performance measure is to hold two outreach and education conferences for small entities. Yet, none of the 1999 performance goals appears to address small-entity issues. Similarly, the awarding of 100 environmental justice grants is listed as a key performance measure. However, it is not clear how these grants relate to the two performance goals associated with environmental justice activities: (1) continue to advise the EPA Administrator on environmental justice issues and (2) continue to ensure that all federal agencies comply with the executive order on environmental justice, review performance measures, and conduct environmental justice projects in coordination with other federal agencies. In another case, the performance goal calls for 15,000 inspections to be performed. Under key performance measures, the plan lists 16 types of inspections across the agency's programs, with targets for each. However, the total number of inspections called for by the measures is about five times greater than called for by the performance goal.

Connecting Mission, Goals, and Activities

EPA's performance plan generally links its performance goals to the agency's mission, strategic goals, and program activities in the budget. The plan's introduction repeats the mission statement and goals from the strategic plan and contains a section on the relationship between the two plans, including changes in the strategic goals and objectives since the strategic plan was issued.² In addition, the performance plan is primarily organized by the strategic goals and objectives, with performance goals,

¹Environmental justice refers to the question of whether minorities and low-income people bear a disproportionate burden of exposure to toxic pollutants and any resulting health effects.

²Two strategic objectives were added to the "Sound Science" strategic goal, and one objective under the "Effective Management" strategic goal was made into two objectives.

resources, strategies, and performance measures grouped by strategic goal and objective. Similarly, the program activities used in EPA's budget request correspond to its strategic goals. This organization of the plan and the budget facilitates the linkage of the performance plan, mission, strategic goals, and budget activities.

Recognizing Crosscutting Efforts

EPA's performance plan does not completely address coordination with other federal agencies having related strategic or performance goals. In discussing strategies to accomplish its performance goals, the plan often refers to coordinating or working with stakeholders, including other federal agencies, to accomplish the performance goals. However, in many of these cases, the plan does not identify the specific agencies, the coordination mechanism used, and/or the results. For other performance goals, the plan does not discuss the coordination of the goals, even though EPA's strategic plan identified all 10 of its strategic goals as having crosscutting areas that require greater integration and review with other federal agencies' efforts.

For example, the strategic plan identified EPA's strategic goal of preventing pollution and reducing risk in communities, homes, workplaces, and ecosystems as needing coordination with the departments of Agriculture, Health and Human Services, the Interior, Labor, and Transportation, as well as other agencies, such as the Consumer Product Safety Commission. The performance plan discusses EPA's efforts to reduce agricultural workers' exposure to pesticides on farms and in forests, greenhouses, and nurseries and establishes a fiscal year 1999 performance goal of reducing the incidence of pesticide poisonings reported nationwide by 10 percent. The plan refers to efforts to work with the U.S. Department of Agriculture and the Food and Drug Administration on this issue but does not describe how their efforts are coordinated. In addition, the plan does not refer to coordinating this issue with the Department of Labor or the other appropriate agencies cited in the strategic plan.

EPA'S PERFORMANCE PLAN DOES NOT FULLY DISCUSS HOW THE AGENCY'S STRATEGIES AND RESOURCES WILL HELP ACHIEVE ITS GOALS

As a result of the agency's decision to combine the plan with its budget justification to the Congress, the performance plan contains substantial information on the resources being requested and the planned activities and strategies. However, the connection among individual strategies, intended results, and resources could be improved.

Connecting Strategies to Results

Although EPA's plan generally discusses the strategies that the agency intends to use to achieve its performance goals, the linkage could be improved. At times, additional information or better linkage of strategies to performance goals is needed to clarify how the intended results will be achieved. For example, one performance goal deals with EPA's responsibilities under the National Environmental Policy Act to review the potential environmental impacts of significant proposed federal actions. The performance goal calls for EPA to review 100 percent of these proposed actions and resolve 70 percent of its concerns with them. The plan briefly describes EPA's responsibilities and the efforts that may be involved in carrying out these responsibilities. It does not indicate how the goal will be achieved; how the 100 percent and the 70 percent relate to the current level of effort; what the significance is of the 30 percent that will not be resolved; and whether any new efforts or revised strategies are planned or are necessary to achieve the goal.

The connection of strategies to intended results would also be clearer if the performance plan explicitly addressed external factors that could have a substantial impact on the achievement of the performance goals. In the "key external factors" section of its strategic plan, EPA states that its ability to achieve its goals and objectives depends on several factors over which the agency has only partial control or little influence, including (1) a heavy reliance on partnership with the states, (2) new environmental technology, and (3) other federal agencies with environmental responsibilities. The performance plan, however, generally does not discuss the potential impact of these factors on fiscal year 1999's performance and the steps that are being, or will be, taken to deal with them.

Connecting Resources to Strategies

EPA's performance plan provides information on the resources that it will use to achieve its performance goals. However, this information is generally limited to dollar amounts and staffing levels. The plan groups performance goals, strategies, and resources by strategic goal and objective, rather than organizing strategies and resources by performance goal. In addition, the discussions of new or revised information systems generally do not provide project costs, schedules, and specific information technology plans. For example, a performance goal in the "effective management" section relates to the agency's computer systems' calculating the year 2000 correctly. However, the performance plan does not provide information on the resources needed to achieve this goal or refer to other plans that provide more details on the agency's approach to the year 2000 computer problem.

EPA'S PERFORMANCE PLAN PARTIALLY PROVIDES CONFIDENCE THAT THE AGENCY'S PERFORMANCE INFORMATION WILL BE CREDIBLE

EPA's performance plan describes the procedures and methods the agency intends to use to verify and validate its performance information. These procedures and methods generally appear reasonable. However, the plan often does not sufficiently recognize limitations in the agency's data, and the plan's discussion of EPA's validation and verification efforts could be more comprehensive.

Verifying and Validating Performance

EPA's performance plan does not fully discuss how the agency will ensure that its performance information is sufficiently complete, accurate, and consistent. Specifically, we found that the plan discusses "key performance measures verification" in each of its major sections. These discussions generally identify the major sources of data that will be used to report on performance and the principal means of verifying and validating the data, such as peer review for research products and quality assurance procedures and quality control methods for computerized data systems. However, the completeness of the individual verification discussions could be more consistent across the plan.

For example, the verification section for the "Sound Science" strategic objective of improving EPA's core business practices states that records will be maintained on reinvention initiatives and changes in core business practices, and that the results will be reported at the end of the fiscal year. The section does not discuss who will be responsible for reporting this information and what steps will be taken to ensure that it is accurate. A similar lack of specificity is seen in the strategic objective to identify and reduce significant noncompliance in high-priority program areas. The verification section states that EPA (1) has prepared a strategic and tactical automation management plan that will significantly affect the quality and reliability of nine of the agency's data systems and (2) is developing and implementing detailed, system-specific quality management plans for all the systems it manages directly. The section does not describe when these actions will be completed and what their impact will be on the reliability of the data for reporting on the agency's 1999 performance.

Individual sections could also be more complete by recognizing the problems that we, EPA's Office of Inspector General, and others have identified during evaluations and audits. For example, we reported in 1997 that EPA's policy on peer review was being

implemented unevenly across the agency.³ In various verification sections, EPA describes its peer review policy and how the process is used but does not discuss the problem we identified. The lack of completeness is also seen in the plan's discussion of emission factors, which EPA uses to estimate air emissions when more reliable data, such as data from continuous emission monitoring, are not available.⁴ In 1997, EPA's Office of Inspector General cited emission factor development as a material weakness under the Federal Managers' Financial Integrity Act. Although the Office of Inspector General noted its concern that reliable emission factors were not available for processes that emit toxic chemicals, the key performance measures verification section for the "Clean Air" strategic objective to reduce air toxics does not appear to recognize and address this data limitation. The plan states that EPA has developed emissions data using emissions factors and activity level data, but it makes no mention of concerns about the reliability of these factors.

Recognizing Data Limitations

EPA's performance plan is inconsistent in identifying data limitations and their implications for assessing the achievement of performance goals. For example, the verification section for the strategic objective of attaining National Ambient Air Quality Standards for carbon monoxide, sulfur dioxide, lead, and nitrogen dioxide contains a paragraph on plans to improve the data. On the other hand, the strategic objective of conserving and enhancing the nation's waters cites state water quality reports under section 305(b) of the Clean Water Act as a major data source. The verification section for the objective makes no mention of documented problems with the data's consistency and quality and its limited usefulness for measuring trends. Trend data are needed to assess the effectiveness of EPA's efforts.

OTHER OBSERVATIONS

In commenting on EPA's July 1997 draft and September 1997 version of its strategic plan, we identified the following major management challenges: (1) setting priorities; (2) using nonregulatory approaches to pollution control; (3) working better with the states; (4) ensuring the quality and completeness of scientific research; (5) obtaining the reliable scientific, environmental, and financial data needed to report on the achievement of its

³Peer Review: EPA's Implementation Remains Uneven (GAO/T-RCED-97-95, Mar. 11, 1997).

⁴An emission factor is the relationship between the amount of pollution produced and the amount of raw material processed. For example, an emission factor for a blast furnace making iron would be the number of pounds of particulates emitted into the air per ton of raw materials.